Official Newsletter of the Fort Vancouver Trades Guild

THE forge & plane

VOLUME VI, NUMBER 1 WINTER 2008

Collaboration with Colonial Williamsburg

Studying the Fort's Axe Artifacts and Techniques Used to Forge Them

Harry Newton

David Stearns striking for Shel Browder; background (L to R) Bill DeBerry and Jac Arnal

Gary Lewis

Axe edge on anvil

ON THE FIRST WEEKEND in March, Fort Vancouver National Historic Site, along with Colonial Williamsburg and the Fort Vancouver Trades Guild, sponsored an axe study, research, and training program.

Study of axes in the archeological collections, which included recording detailed data and exploring the blacksmithing techniques used to produce the axes, took place February 28 through March 2, 2008.

Colonial Williamsburg blacksmith Shelton Browder, who has demonstrated historic blacksmithing techniques at several guild-sponsored workshops, has also had considerable experience evaluating artifacts. He headed up the project, assisted by Historic Sites Coordinator Bill DeBerry, and volunteer members of the Fort Vancouver Trades Guild.

The first two days were spent recording data on the axe heads in the Fort Vancouver collection, noting their measurements and analyzing forging techniques. Two days in the blacksmith shop followed, where participants

attempted to replicate the techniques that close examination indicated were probably used to produce the axe artifacts. Everyone finished up with an improved understanding of how blacksmiths in the Hudson's Bay Company shop actually worked. We hope to publish more on this workshop in a future issue of the *F&P*. Participating were Ike Bay, Dave Stearns, Jac Arnal, Bob Race, Jeff Cawley, Dennis Torresdal, Craig Webster, Gary Lewis, John Christiansen, Tom Dwyer, Gideon Douglas, Harry Newton, Tyson Bennett, Fred Cormack, and Peter Mountford. ♦

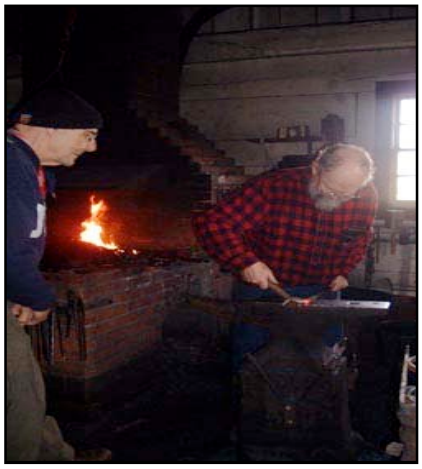
Photos: S.Gawecki

Merlyn Lewis and volunteer apprentice carpenter

Training in the Shops

THE FIRST WEEKEND in February was busy at the shops. In the carpenters shop, Saturday, February 2, Rob and Merlyn Lewis provided training on sharpening techniques. Rob had handy tips on keeping an old stone smooth and flat by using a ceramic stone on its surface as an abrasive. He also suggested interesting ways to use "micron paper," an auto-body workshop abrasive paper backed with a waterproof adhesive. Rob simply mounts different grits on a scrap piece of Corian® plastic countertop. The resulting abrasive surface is waterproof, light, and portable. Rob also stressed the fact that all sharpening operations require liberal use of a lubricant, either water or oil, to keep the metal particles from clogging the surface of the stone or abrasive paper.

Ranger Bill discussed the proper technique for sharpening a saw, with specifics on the different angles to be sharpened depending on how the saw is used. A most important and frequently overlooked step is first, before beginning to sharpen and correct the set of the saw teeth, to make sure that all teeth are in a level plane and that any concavity in the saw has been corrected by filing true across all the teeth at the same time. For this process, known as *jointing,* it goes without saying a jig is required to level the teeth. Guild members who want a quick review should see an excellent article on saw sharpening published in the May 1980 issue of *Fine Woodworking*.



Jac Arnal watches David Stearns at work on a scroll

Across the way in the blacksmiths shop, on Sunday, February 3, guild members Jac Arnal, Harry Newton, Gary Lewis, and Susan Gawecki attended a training session with founding guild member David Stearns. David reviewed basics of fire building and maintenance, hammer swing, and body positioning before moving on to demonstrate scroll making. Gary and Susan stuck around for some individual instruction with David, who bounced back and forth between their forges with tips and suggestions.

Many thanks to Rob, Merlyn, Bill, and David for their time and for sharing their knowledge with guild members. ♦

Learning to Make Damascus Steel Knives

LAST DECEMBER, thanks to a generous grant from the Fort Vancouver Trades Guild, I was privileged to attend a two-day workshop on knife making, held at guild member Nick Marcelja's shop, here in Vancouver. I hope in this article to share what I learned and familiarize you first with the process of making Damascus steel, then with using it to make knife blades. What is Damascus steel? The Damascus of legend, also known as Woods, was a very high-carbon crucible steel. Bits of steel, iron, and carbon were heated in a ceramic crucible at very high temperatures until all had fused together. The high carbon content of Damascus steel (usually above 2%) results in lots of carbides, which precipitate out to form lines on the steel's surface. These lines of carbides create the beautiful "watering" effect that Damascus is so famous for.

J. Arnal

Damascus blade made from the *X* pattern, with a handle made from a deer antler. End pieces are buffalo horn from Africa.

In Wayne Goddard's *$50 Knife Shop,* he describes how he made a list of types of Damascus steel that ended up with eighteen different terms, including electrical discharge machining, powder filled patterns, and layers made of powdered metallurgic steel, just to cite a few. What I like the best about Goddard is his acknowledgement that the Damascus knife is no longer a cutting tool or a weapon but a "canvas" — an art form artisans use to express aesthetic ideas. In contemporary usage, Damascus steel is now known as pattern welded steel.

Making the steel

At Nick's shop we used five pieces of 1095 steel and five pieces of 15N20 steel. It is very important to clean the steel on both sides with a grinder, to make a clean surface for good welding. At one end, we welded all the pieces together with a length of. half- inch rebar for easy handling. First we used a wire to hold the ten pieces together during the weld. Now we were ready to heat to welding temperature and weld, using borax for flux. Next, we used the power hammer to create a bar two feet long by one inch wide. We folded this piece, welded it, and forged it into another bar, two feet long by one inch wide. We repeated this process three times. Then we forged a final bar, three feet long by one inch wide by ¼ inch thick.

To create our patterns, we divided the bar into thirds. One third we ground with an *X* on both sides; one third was ground with parallel lines on both sides, to create a ladder pattern; and for the remaining third we drilled small spots on both sides, to create a raindrop pattern. Then we forged the bar down to knife-making thickness, about ⅜ inch, with the power hammer, making sure that all traces of the grinding design were removed.

Making the knives

Knife making was straightforward. I made a rough drawing of my blades on a piece of paper then proceeded with forging the blades and making the tangs. My blades were free-form, pleasing to my eyes: I was only there to learn how to make knives and had no need to duplicate anything precisely. To finish the blades, I had to learn to use the 72-inch band

grinder at Nick's shop. Choosing the right grits to make the blades very smooth was quite a challenge.

I enjoyed the class very much, and I know that I will be spending the rest of my life learning knife-making techniques to do (and not to do). *The $50 Knife Shop* and *The Wonder of Knifemaking*, both by Wayne Goddard, are good references before, during, and after a knife-making class. ♦ — *Jac Arnal*

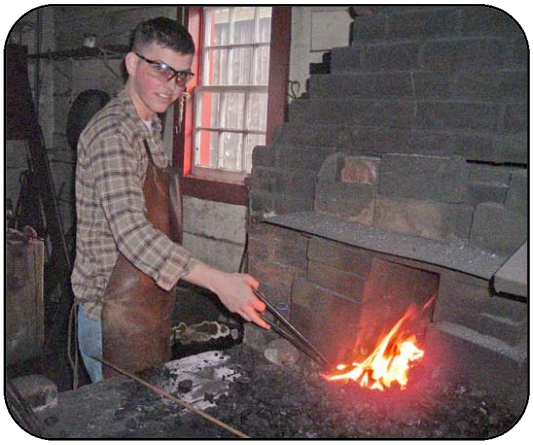
Notes from the President

WE HAD AN EXCELLENT work-study event at the beginning of March with Shel Browder, from Colonial Williamsburg, focused on axes in the fort's archeological collection (see page 1). Now that spring is finally right around the corner, it's time to start gearing up for this year's round of off-site demonstrations and events. The first of these, the annual Draft Horse Competition takes place the first weekend in May, at Champoeg, so mark your calendars. I'll get an email out to everyone as soon as details are final. Once again, I urge guild members to participate in off-site events and demonstrations: it's the best outreach we can do, not only for blacksmithing, but for Fort Vancouver! ♦ — Gary

Gary Lewis, Guild President

ABANA News

PEOPLE INTERESTED in receiving content-specific news from ABANA can sign up to join any of several interest groups: here's how. Go to *www.abana.org* and scroll down to the very bottom of the home page. You will see a box that says "sign up NOW for ABANA e-mail"; enter your e-mail address in the box and click "go." That will take you to a form with interest groups that you can opt in (sign up) for. Then, from time to time, you will receive e-mail containing material related to the interest groups you selected. ♦ — *Rome H. Hutchings, Chairman, ABANA Membership Services*



S. Gawecki

Bob Conner's star pupil, Joshua Jury

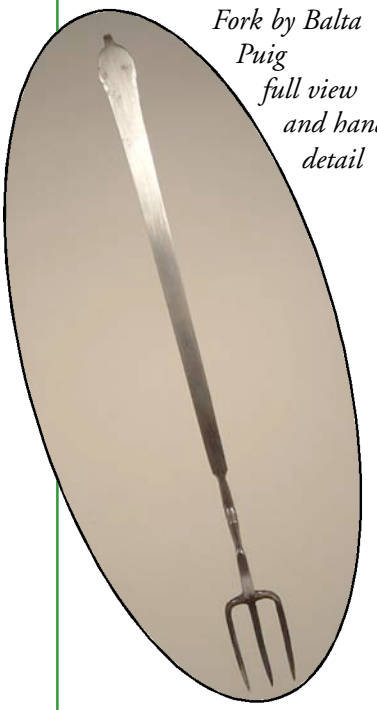
Joshua Visits the Shop

JOSHUA JURY visited the blacksmiths shop December 17 while he was home on leave from the U.S. Marine Corps. Joshua came to the fort to smith with his old friend Bob Conner. Before he enlisted, Joshua used to smith with Bob at Phillip Foster Farms, in Estacada, Oregon. He was still a boy when he started with Bob as a volunteer blacksmith at the farm — and like all youngsters, of course he wanted to make a sword.

Joshua has just finished four months in Iraq, where "swords" are real, with the 3rd Battalion of the 1st Marines, 31 Lima Company. He has two years left to serve and expects to be redeployed to Okinawa, Japan, or to Afghanistan. Josh is a bright, upbeat young man whom we plan to shanghai and make into a permanent volunteer once he's back in Oregon to stay. ♦

Thanks, Ted!

MANY THANKS to Ted Anderson for arranging our post-Christmas cleanup of the shop on December 27. The shop looks a lot better with a more appropriate table in place of the folding table that had been serving as a bench while the east sill is repaired. ♦

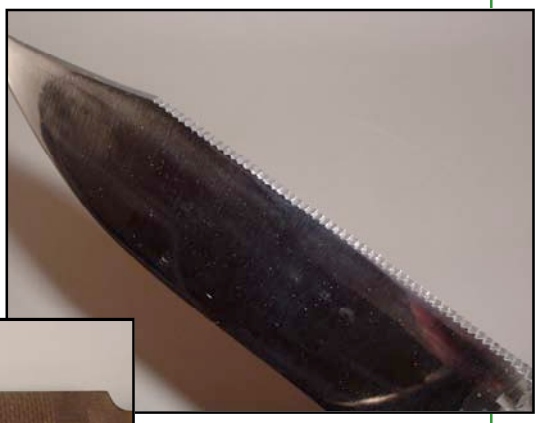


Fork by Balta Puig full view and handle detail

gallery of guild work

The *Forge & Plane* proudly presents these photos of work by guild members John Prutsman and Balta Puig. We look forward to showcasing the work of other members and will be happy to capture your favorite piece digitally for publication.

Knife made from a farrier's rasp by John Prutsman Clockwise from left: handle detail, edge detail, knife and original rasp



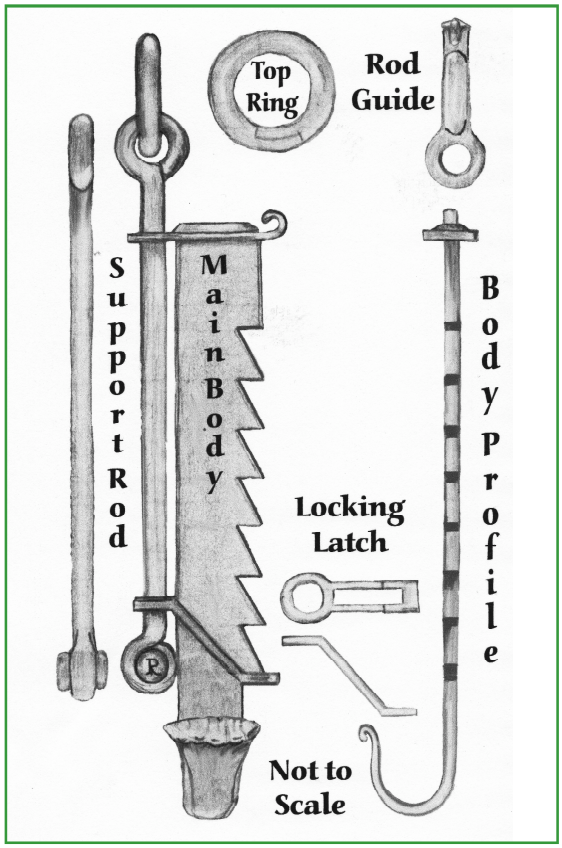
Photos: S Gawecki

The Saw-toothed Trammel

Bob Race

CONSTRUCTING a simple trammel hook, a tool to hang cooking pots or kettles from a lug pole within the hearth or from a tripod over the campfire, is not very complicated or time consuming. The simplest trammel is a metal strap with a hook at the top end. The strap has a series of holes along its length and a right-angle bend with a hole punched in the center at the end opposite the hook. This simple trammel has a second piece, made from round stock with a right-angle bend at one end and a hook at the other. The bent end of the round stock is threaded first through the hole in the flat stock's short leg, then through any of the holes along its length.

Another kind of trammel uses a chain with an open hook at one end and a double hook at the other. One end of the double hook fits in any loop along the chain and the other end goes through the bail of the pot. There are many varieties of trammels, including some large and complicated versions for the massive kitchen fireplaces in European castles.



Saw-toothed Trammel

A saw-toothed trammel is a little more detailed than trammels using a strap or a chain. It has five parts: the main body, the support rod, the top ring, the rod guide, and the locking latch The two main fittings are the saw-toothed body, to which the rod guide is mortised and tenoned, and the support rod, with the top ring attached at one end and a stop at the other to prevent the locking latch from sliding off. All of the pieces can be finished to their final stages before assembling.

Making a Saw-Toothed Trammel

The *main body* is made from 3/16″ x 1″ x 12″ flat stock. From one end make a mark at 3/16″and another at 9″. At the first mark, make a tenon in the center that is 3/16″ x 3/4″. At the 9″ mark use a butcher to cut in about 1/4″ so the flat side of the butcher is perpendicular to the edge. Draw this section out to 3/4″ x 4″creating a right angle at the 9″ mark. (This will be the bottom tooth.) At the end of this drawn-out section, taper about the last 1/2″ and flare each side so you can bend it around to make a hook with a radius of about 3/8″ to 1/2″. The teeth can be hacksawed in to a depth of 1/4″ at one tooth per inch. Cut in the vertical slots first, then the diagonals, to provide an aiming point when you cut the slope side. The teeth can be cleaned up with a file.

The *support rod* is made from a piece of 3/8″x 13 1/2″ round. The upper end is formed into a loop to hold the top ring loosely. For the other end, either a welded collar or a

short-section loop should be made to prevent the locking latch from slipping off.

Both *rod guide* and *locking latch* should be made from 3/16″ x ½″ x 2¾″ stock (especially important for the latch, since it bears as much weight as the main body and the support rod). For the ring section of each piece, start by making a slit ⅜″ in from the end, on center, using a ½″ slitter. Expand this out to a 7/16″ hole on the tip of a small horn or a bick iron. Cut a second slit on center, about 3/16″ from this ring. Make this slit about ⅝″ long, then drift it to 3/16″ x ¾″ to accommodate the main body's tenon. The locking latch is done in very much the same way, only its narrow slit should be at least 1½″ long, which requires a piece of stock about 3½″ long. Test all pieces where they need to slide or be free.

The *top ring* is simply a 6¼″ length of ⅜″ round. Half-lap each end about ⅜″" to cover the joint. Welding is another option if you like doing that sort of thing.

Assembling the Trammel

To assemble, open the upper ring of the support rod enough to slip on the locking latch so it can slide down to the hook. Now, slip the rod guide over the support rod, position its slot over the main body's tenon then rivet it into place. (This can be done cold, but using an oxy-propane torch makes a neater job.) Next, slip the top ring into the upper ring and close the upper ring. That's all there is to it! ♦

Fort Visitor Center to Be Updated

THE NPS and Fort Vancouver National Historic Site are pleased to announce a redesign and expansion of the visitor center, thanks to efforts of Senator Patty Murray, Representative Brian Baird, the State of Washington, the City of Vancouver, and the Vancouver National Historic Reserve Trust. The remodeled center should be open for public use by 2011. ♦

FORT CALENDAR

April

Public History Field School
April 5 – June 22

Crochet at the McLoughlin House
Oregon City
Saturday, April 12, 12:00 PM – 4:00 PM

Nez Perce Chief Redheart Memorial Ceremony
Saturday, April 19
Lower Parade Ground, Fort Vancouver
TO BE CONFIRMED

National Park Week
April 19 – 27

City of Vancouver Discovery Walk Festival
Friday, April 25 – Sunday, April 27

Sixth Annual Children's Cultural Parade
Friday, April 25, 9:00 AM – 11:00 AM

National Park Family Day
Saturday, April 26

For more information on any events
360-816-6230 or *www.nps.gov/fova/home/htm*

EVENTS FOR BLACKSMITHS

NWBA Spring Conference 2008
Mount Vernon, Washington
Friday, April 25 – Sunday, April 27
Information
Dave Davelaar (360-293-7214)
davelin1@verizon.net

Founders' Day & Draft Horse Plowing Competition
Champoeg State Park
First weekend in May
http://www.champoeg.org/

Antique Powerland Great Oregon Steamup
July 26 – 27, August 2 – 3
503-393-2424 or *www.antiquepowerland.com*

More Common Household Items Useful in the Shop

Catsup – "Gentle" cleaner for brass. Mix 50/50 with water and immerse small items from 2 hours to overnight. Leaves a soft, matte finish. To avoid damage do not leave the items in the solution for long periods, as the acid in the catsup will attack the zinc in the brass.

Cheesecloth – A lint-free, open-weave fabric. Fold into a small pad, load with an appropriate solvent and wipe surfaces for lint-free application of stains to surfaces. Also use to strain paint or other liquids. Use to make a tack rag for wiping dust from surfaces prior to painting (dip a piece about 12" square into clean water and squeeze dry. Mix 3 tablespoons of varnish with some paint thinner and sprinkle onto the material. Knead the cloth until it is saturated with the mixture. Don't overdo it. A tack rag should be tacky enough to pick up dust but not to stick to surfaces.

Citric Acid – A mild acid present in many fruits, vegetables and carbonated beverages (the highest concentration is in lemons and limes). May also be found in concentrated form in the baking or canning sections of the grocery. Citric acid may be used to remove rust from tools. Mix with a little alcohol (rubbing alcohol is fine) and a dab of detergent and apply to rusted surfaces. Heavy rust may require immersion overnight. Rinse and scrub off with a fine Scotch-Brite pad. Surfaces should be clean of oil before applying the solution.

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Household Items *reprinted from* The Upset, *September 2007, published by the Mississippi Forge Council. The MFC and author Tommy Ward urge readers to inform themselves about the chemicals and use them responsibly and safely. Watch for the continuation of this fascinating list in future issues of* The Forge & Plane. — *Editor*

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THE forge & plane

The Forge & Plane is the official newsletter of the Fort Vancouver Trades Guild. Please send your comments, submissions, and suggestions to

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